WEST VIRGINIA DEPARTMENT OF
NATURAL RESOURCES

WILDLIFE RESOURCES
DIVISION

WEST VIRGINIA NONGAME NEWS

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Mosquito Hawks

Robert A. Jordan

Who has not, as a child or adult, paused by the water's edge to marvel at the strong, graceful and superbly controlled flight of the dragonflies? Locally called mosquito hawks, darning needles and snake doctors, their flight is of such speed and poise as to entrance the spectator. The loud, papery rustling of their cellophane-like wings is well known to frequenters of ponds, streams and marshes.

Dragonflies have remarkable maneuverability and an agility in the air that surpasses most birds. From a top speed of 60 miles an hour, some of the larger dragonflies can abruptly change course to avoid the collector's net, wheel about in pursuit of prey, alight gently on a cattail stalk, or hover just above the water's surface. This hovering has earned them the nickname of snake doctor, because it was believed that the big insects were actually feeding or acting as sentinels for snakes and that they could even restore dead serpents to life.

Dragonflies are perhaps the most primitive of modern insects. They have changed little in form from their fossilized ancestors of 350 million years ago. Prehistoric dragonflies, the oldest known insects and probably the first flighted creatures, had wingspans of more than two feet.

The insects are readily recognized by their four nearly equally-sized and stiffly outspread wings. They are unable to fold their wings and are the only insects that still possess this primitive wing structure. The dragonfly's wings are its livelihood, for almost its entire adult life is spent in the air, "hawking" for mosquitoes and flies. It captures its flying prey by forming its six legs into a basket and scooping the unwary mosquito out of the sky. Since the legs of dragonflies are shifted forward on the body to enable them to feed in flight, they are poorly adapted for walking and are used instead to cling to perches during periods of rest.

Adult male dragonflies patrol territories that may be long strips above the water or smaller areas around a central perch. They have large, bulbous eyes that allow them almost 360 degree vision. If a rival is sighted, the jealous male will leave his perch and race in pursuit. When rivals clash, the observer is treated to a spectacular display of aerial acrobatics accompanied by a violent clicking of mouthparts and a loud rustle of wings. Rarely do battles between evenly matched rivals end in death, but smaller dragonflies that choose to stand and fight are often quickly dispatched.

Despite being such expert aerialists, dragonflies spend the greatest part of their lives in water. The adult female lays her eggs by flying just above the surface and dropping them into the water. Some dragonflies drag their egg-laden abdomens through the water to wash the eggs off. Others deposit their eggs on the stems of plants above the low summer water level. Hatching occurs the following spring when the higher water levels immerse the waiting eggs.

Dragonfly eggs hatch into peculiar, monstrous-looking larvae called naiads (after the water sprites of Greek mythology) that crawl through the ooze of a marsh bottom or stalk their prey through the jungle of emergent plants at a pond's margin. Darkly colored, flat and spiny, they are often indistinguishable from the bottom debris. Naiads are remorseless predators and will capture and consume animals (including small fish) that are larger than themselves.

Most dragonflies pass their first winter as naiads and can be active on a pond bottom even under ice. The larger dragonflies, such as the familiar green darner, may remain as naiads for as many as three to four years before finally molting into adults. To complete its transformation into a winged adult, the naiad crawls out of the water onto a rock or

(Continued on Page 3)

Nongame Wildlife Weekend—A Success Story

Have you ever visited a snake den nestled among rocks of a canyon wall?—dipped a net into a mountain stream and watched fish eggs hatch before your very eyes?—or ran across an open meadow chasing unusual butterflies and insects? These were just some of the many exciting activities offered at the first annual Nongame Wildlife Weekend held in June at Blackwater Falls State Park.

The weekend featured slide presentations, field forays and exhibits on WV's nongame wildlife resources. The event was a cooperative effort between 3 agencies of the WV DNR: the Conservation and Environmental Education Section, the Nongame Wildlife Program, and the Parks and Recreation Division. Attending the event were over 250 interested individuals from many different walks of life. In addition, the Nongame Wildlife Fund sponsored 25 teachers from school districts around the State to participate and learn about nongame wildlife for classroom use.

Short presentations were given by experts on such topics as WV's endangered species, small mammals, birds, insects, salamanders and frogs, plants, fishes and snakes. Field trips were conducted throughout the weekend including early morning bird walks, hikes to discover animals and plants of wetlands, bogs, forests and fields, and an evening excursion to identify the calls of nocturnal creatures. Also featured were educational displays and live exhibits of WV's nongame wildlife resources.

In 1985, the weekend will again be held at Blackwater Falls State Park June 7-9. If you are interested in attending next year, contact the Nongame Wildlife Program.

Habitat Hints

● Increasing numbers of hummingbirds in the west and midwest, especially during migration, are being killed by electric fences; apparently the tiny birds are attracted to red insulators which they mistake for flowers. Two styles of the "Red Snap 'R" insulator, TP and RP, seem to be causing the majority of fatalities. These insulators fit on a metal supporting rod which holds the electrified wire. When the hummingbird lands on the wire and probes the hole in the insulator with its bill in such a way to contact the metal rod, electrocution results. To alleviate this situation, landowners are being asked to paint the insulators white or black, increase the distance between the metal rod and fence so that the birds cannot sit on the wire and reach the insulator or to use a fiberglass instead of a metal rod.

Peak migration for hummingbirds in West Virginia is from late April to early May in the spring, and late August through September in the fall. Efforts to persuade the manufacturer to change or discontinue the "Red Snap 'R" have been to no avail. Please report mortality to the WV Nongame Program or

Mr. Carrol Henderson
Nongame Supervisor
Minnesota Department of Natural Resources
Box 7, Centennial Building
658 Cedar Street
St. Paul, MN 55155

This will allow biologists to accurately assess the distribution and frequency of the problem.

Who Shall Pay to Conserve Nongame Wildlife?

The Interior Department's U.S. Fish & Wildlife Service (USFWS) is investigating 18 potential sources of revenue that could be tapped to support state nongame wildlife programs. This effort to identify an equitable source of public funds to foster the conservation of nongame wildlife is required by the Fish and Wildlife Conservation Act of 1980.

Although Federal income taxes and certain state taxes help support some fish and wildlife management programs (not in West Virginia, however), sportsmen have traditionally carried the bulk of this financial responsibility. State fish and game management is supported largely through the sale of hunting and fishing licenses and supplemented by Federal excise taxes on fishing and hunting gear. Although nongame species have benefitted indirectly through these programs—land acquired and developed for waterfowl also provides habitat for shorebirds and cranes for example—nongame species lack a specific, comprehensive, and reliable source of funding.

A national survey by the USFWS in 1980 estimated that $6.6 billion is spent each year by non-hunters and fishermen on equipment, travel and related expenditures for wildlife recreation. Nearly $1.2 billion is spent on binoculars and photographic equipment, while $517 million is devoted to bird feeding each year. Although hunters and fishermen have had to pay for their sport, those Americans who hunt with binoculars and cameras and enjoy wildlife in other ways have not been required to financially support their pastimes.

The potential sources of revenue currently being examined by the USFWS for state nongame programs include:

* Annual appropriations from general U.S. Treasury funds
* Fees on minerals extracted from Federal lands and waters
* Sale of "semi-postal" stamps whose cost would cover basic postage and a contribution to nongame programs
* User fees on selected Federal lands and waters
* A voluntary Federal income tax "checkoff"

The sources also include special taxes on:

* Wild bird seed
* Wild bird houses
* Wild bird feeders
* Wild bird waterers, birdbaths, and heaters
* Fur from wild animals
* Backpacking and camping equipment
* Off-road vehicles
* Binoculars, monoculars, and spotting scopes
* Wildlife identification books
* Recreational diving equipment
* Photographic equipment and film
* Travel trailers and campers
* Motorhomes

After studies of these potential sources are complete, the USFWS will present its final recommendations to Congressional committees by December 31, 1984.

Wildlife Artist

The majority of line drawings that have graced the pages of the Nongame News have been the work of Stuart Helmintoller. A native of Rock Cave, West Virginia, Stu received his B.S. degree in Wildlife Management from Ohio State University. His art training began with private painting classes as a child, followed by art classes in secondary school and courses in life drawing at Miami University of Ohio. He has photographed and studied nature throughout the U.S., but the Appalachians remain his favorite. His reliance on extensive photo files for reference is reflected in the realism of his artwork.

Until recently, Stu was employed by the Wildlife Resources Division of the DNR and as time allowed from his regular duties at the French Creek Game Farm, he illustrated numerous pamphlets, posters and other publications for the Division, including the Nongame News. Stu is now assistant Superintendent at Holly River State Park. We wish him the best of luck with his new job, even though it will mean we will see less of Stu's drawings in the Nongame News.

Rare Plant Survey

Rodney Bartgis, TNC Ecologist

The West Virginia Division of Wildlife Resources' Wildlife/Heritage Data Base and the West Virginia Chapter of The Nature Conservancy undertook a cooperative program in 1983 to review the status of selected rare plant species in the State, including those under review for inclusion on the federal endangered and threatened species list. Seventy historical populations were investigated. Many of these were found, a few were not, and some populations were discovered to have been destroyed by human activity. In addition, new populations of rare species were located. In all, over 140 existing rare plant populations were surveyed, making it the most comprehensive field survey of rare plants ever conducted at one time in West Virginia.

Among the finds during the survey were: *Eleocharis compressa* (flat spikerush), which had not been recorded in the State since 1898; a Monroe County location for *Saxifraga michauxii* (Michaux's saxifrage), a Southern Appalachian endemic previously known only from a single Pendleton County site; a very large population in Mingo County of *Synandra hispidula* (synandra), a species under review for the federal list; and a relocation of *Listera cordata* (an orchid) on Cheat Mountain, where it had not been recorded since the 1930's. Also discovered was a population of *Trifolium stoloniferum* (running buffalo clover), a species under review for federal listing for which no verified record has existed since 1940.

Among other candidates for the federal list, located were three new populations of *Ptilimnium fluviatile* (harperella), which is considered to be one of the rarest plants in eastern North America, plus the largest known populations of *Paronychia virginica* (yellow nailwort) and *Euphorbia purpurea* (glade spurge). All told, populations of sixteen species under federal review were studied. In addition, the first cedar glade known in West Virginia was discovered. This savannah-like ecosystem contains many rare species, including large populations of two species proposed for the federal list.

SAXIFRAGA michauxii

(Reprinted from *Flora of WV*)

This new information is currently being added to the Wildlife Division's Wildlife/Heritage Data Base. So as not to lose these valuable elements of our nation's natural diversity, The Nature Conservancy is currently developing conservation programs for several of the sites studied. This cooperative program has greatly enhanced our understanding of West Virginia's rare flora.

Endangered Species Notes

● Brown Pelican Recovery

According to representatives of the U.S. Fish and Wildlife Service, the eastern brown pelican has been proposed for removal from the endangered species list in several states. The recovery of this species is due mainly to decreasing environmental residues of persistent pesticides such as DDT, which had caused the decline both through direct poisoning and effects on reproduction. The brown pelican is still considered endangered in many southern states.

● Dusky Seaside Sparrow

Only five birds—all males—are left of this Florida species. An attempt was made this past spring to back-breed the endangered sparrow with the common Scott's seaside sparrow. Only one of the females produced eggs, three, none of which hatched. Although a second attempt will be made, researchers suspect that the eight-year-old males are too old for successful breeding.

MOSQUITO HAWKS

(Continued from Page 1)

plant stalk. Within two hours the larval skin splits neatly down the back and the soft and still very vulnerable adult emerges. After another thirty minutes, during which blood flows through the new adult's body and stiffens its wings, the dragonfly is fully expanded and flies away leaving the cast-off larval skin still clinging to its last perch. Many of the larger dragonflies spend the first week of their adult lives well away from open water and may require several days to take on their proper color.

Dragonflies are an important part of the ponds and marshes where they live. They serve us in their relentless pursuit of annoying insect pests that can make our visits to the water less than enjoyable and entertain us with their remarkably adept and colorful flight. Without the papery rustle of their wings on a warm summer's afternoon, West Virginia wetlands would be less interesting places to visit.

Nongame Project Review

● The Fishes of West Virginia

Beginning in May of 1983, a five-year study was initiated to complete sampling and identification of all fishes that inhabit West Virginia streams and lakes.

For the past 50 years, various scientists have been collecting representative samples of West Virginia fishes. Dr. Jay Stauffer of Pennsylvania State University, principal investigator, will be consolidating his information as well as completing collections. All previous and future collections will be transferred to the Fish Museum located in the Elkins Office of the Department of Natural Resources. Research results will culminate in a publication entitled "The Fishes of West Virginia," complete with line drawings.

● Cooperative State-Club Nongame Projects

Application booklets for 1985 nongame wildlife project grants are still available. Any club, organization or institution interested in conservation may apply for a grant of up to $500 for projects that benefit nongame wildlife. Applications must be postmarked by October 31, 1984. Interested groups should write the Nongame Wildlife Program, P.O. Box 67, Elkins, WV 26241.

● State Parks Cooperative Nongame Program

Three trails, located in Canaan Valley, Blackwater Falls and Pipestem State Parks are being developed as Wildlife Observation Areas. These self-guided trails will feature interpretive signs, observation platforms and educational brochures dedicated to nongame wildlife. In addition, four interpretive slide shows and two nature center displays on nongame species are currently being designed by Parks and Recreation Division naturalists.

● Bald Eagle Nestlings Banded

Two bald eagle nestlings were banded recently in Hardy County by personnel of the WV Wildlife Resources Division and the National Wildlife Federation Raptor Information Center. Although 1984 was the fourth year bald eagles have nested in West Virginia, this was the first time the offspring have been banded. Each bird received a metal band on one leg and a white plastic band on the other leg. The plastic band is engraved with a black number-letter combination which can be read from a distance with binoculars. The purpose of banding is to allow biologists to recognize individual eagles, record seasonal movements, and determine whether birds hatched in West Virginia return to nest. Report sightings of banded eagles to the Nongame Wildlife Program at the Elkins address. Phone: (304) 636-1767.

● Nongame Wildlife Area

On June 30, 1984, Senator Jennings Randolph dedicated a 50-acre wildlife sanctuary along the south side of the Potomac River in the names of Ruth Cowan Nash and the late Mary Babb Randolph. The land for the sanctuary was donated by the Mayor of Harpers Ferry, Bradley Nash, and his wife, Ruth Nash. Twenty acres has been incorporated into the adjacent Harpers Ferry National Historical Park and the remaining 30 acres will eventually be developed as a Nongame Wildlife Observation Area through the WV Nongame Wildlife Program. The property adjoins the eleven acres donated by Mr. and Mrs. Bryon H. Webb of Harpers Ferry as reported in our Winter/Spring issue.

It is the policy of the Department of Natural Resources to provide its facilities, accommodations, services and programs to all persons without regard to sex, race, color, age, religion, ancestry, national origin, or handicap. Proper licenses/registration and compliance with official rules and regulations are the only source of restrictions for facility use or program participation.

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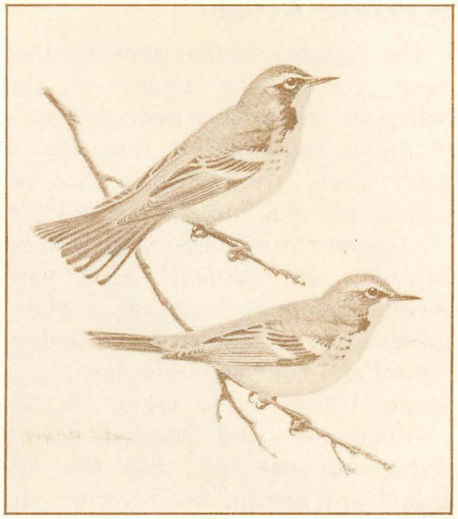


West Virginia Birds

For more than 40 years State residents, particularly bird fanciers, have not had a bird book of their own. Well, the wait is over. George Hall's new book, *West Virginia Birds: Distribution and Ecology,* fills that void. Published by the Carnegie Museum of Natural History in cooperation with DNR's Nongame Wildlife Program, it contains detailed information on the 304 species known to occur in the State.

Hall looks at every known West Virginia bird specimen and discusses such topics as breeding, status (migrant, winter visitor or casual wanderer), population size and frequency of occurrence. He often mentions habitat and food preferences, and notes distribution by region and county.

The 190-page hardbound book includes 21 photographs, 10 distribution maps and 12 line drawings of birds by George Sutton. Page size is 8½ x 11. A remarkably complete bibliography of all that has been written about or known about West Virginia birds, the book is a *must* for all serious bird students in this region.

Copies may be ordered from: Publications Secretary, Carnegie Museum of Natural History, 440 Forbes Ave., Pittsburgh, PA 12513 or The Brooks Bird Club, 707 Warwood Ave., Wheeling, WV 26003. Cost is $20 plus $2.50 for shipping and handling. Copies are also available in your local bookstore.

Peregrine Falcon—The Road to Recovery

Kenneth B. Knight, DNR Biologist

The peregrine, a large relative of the more common sparrow hawk, or kestrel, is cosmopolitan—with almost worldwide distribution. In North America, peregrines historically nested from the Alaskan arctic to Georgia. North American and European peregrine populations declined, but nowhere else were they eliminated over such a significant portion of their range as in the eastern United States. By 1964 the peregrine no longer bred in eastern North America.

Along with other birds of prey, peregrines began to dwindle after World War II due to the increased use of DDT and similar pesticides. Residues of these chemicals accumulated in the bird's body, and among other problems, caused eggshell thinning. Frequently, eggs broke under the parent's weight before the young birds hatched. Indiscriminant shooting, collecting of eggs and adults, habitat degradation, and even natural predation, contributed to the population decline, but DDT dealt the final blow.

In 1965, a survey of the eastern United States failed to locate even one pair of breeding falcons. Work began immediately to restore the falcon to this portion of its range. Biologists spent the next few years conducting research on captive breeding and release techniques. In 1974, the first captive-reared peregrines were released in New York. Since then, 511 falcons have been released, primarily in New England, along the mid-Atlantic coast, and in the Chesapeake Bay region. Reintroduction efforts have produced positive results. A naturally nesting pair of birds was found in 1979. By 1983 the number of nests had increased to nine.

The peregrine nested in West Virginia until 1950. Historically the nest sites, called eyries, were concentrated in the eastern panhandle, but records also exist from Greenbrier and Wyoming Counties.

Efforts to re-establish the peregrine falcon in West Virginia began in 1983 as part of the endangered species work conducted by the Nongame Wildlife Program. This program is funded by West Virginians who donate a portion or all of their state income tax refund or make direct contributions to the Department of Natural Resources for nongame wildlife management and research.

The first step in re-establishing peregrines is to locate and evaluate former eyries. Historically, peregrines nested on high rock outcrops, often overlooking large streams or rivers. However, they have adapted to civilization, and will build nests on urban buildings, bridges, and other man-made structures. The nest is usually placed on a ledge that affords a commanding view of the surrounding landscape. The birds scrape out a narrow depression for the eggs—an evolutionary adaption that keeps the rounded eggs from rolling off the edge. Nine historic sites have been located in West Virginia. Other potential sites, which may or may not have supported peregrines in the past, will also be evaluated.

The next step entails determining the presence or absence of great horned owls in the vicinity of prospective release sites. Owls respond to recorded owl calls during the January-February breeding season. Great horned owls are the peregrine's worst natural predator and will kill nestlings as well as newly fledged falcons. For this reason, it is crucial to know if an area is free of owls before a release is attempted. Once a peregrine population is established, they seem to be able to "hold their own" against these winged predators.

When preliminary steps have been completed—within the next 3-4 years—five-week-old peregrines will be obtained from the captive-breeding facility at Cornell University. Upon arrival at the release site, the young birds will be placed in a box which is screened on one side so the birds can become accustomed to the surrounding environment. They will be fed daily through a chute with their caretakers concealed to prevent the birds acquiring dependence on humans for food. At seven weeks of age, young falcons are ready to test their wings, so the mesh front will be removed from the box. For the next few weeks, they will practice flying and hunting skills, returning to the box frequently for food and rest. When nine to ten weeks old, peregrines are self-sufficient and may leave the area. This method of releasing hawks is called "hacking" and is adapted from an age-old falconry technique.

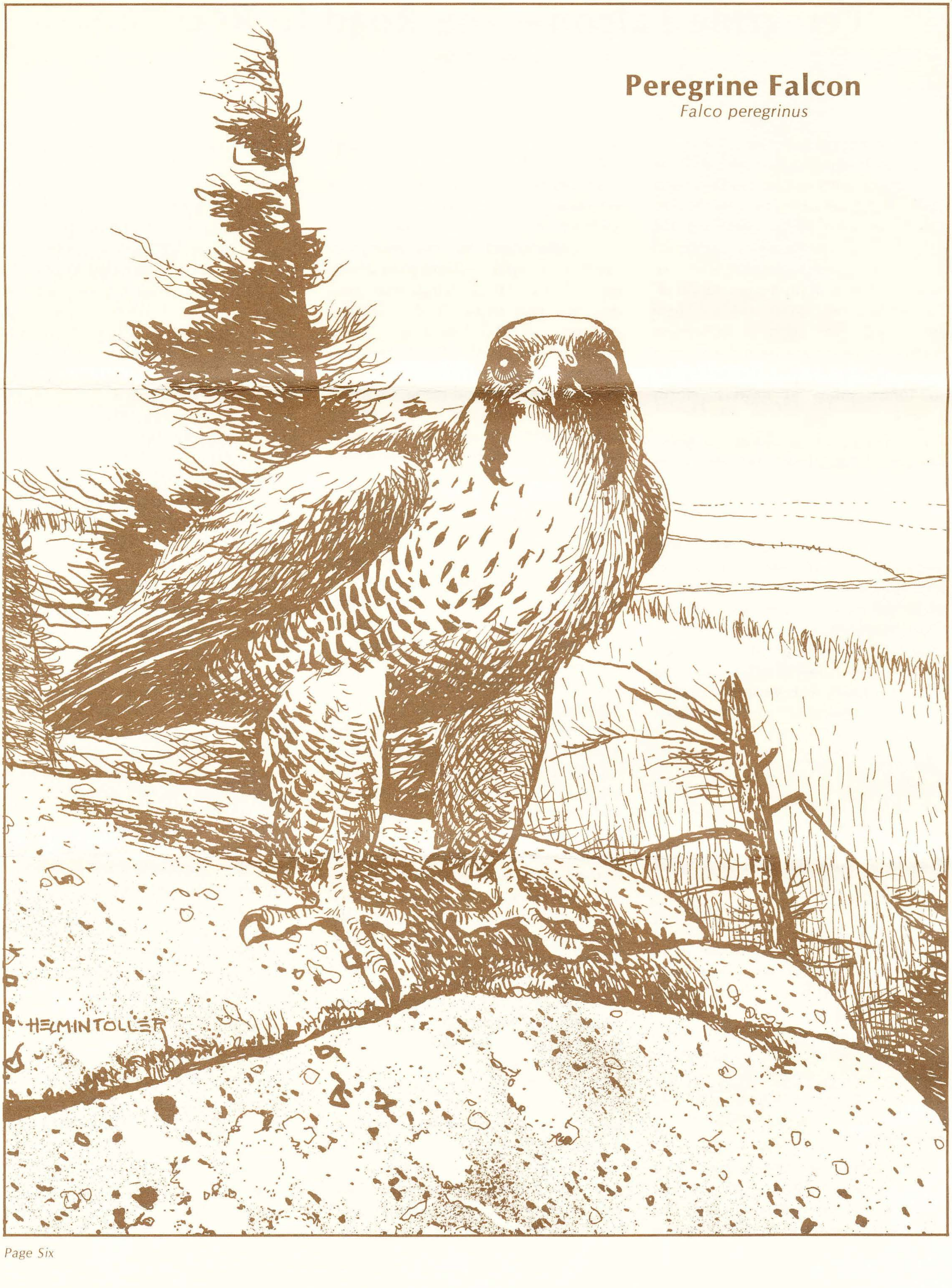
Studies have shown that only half of the released falcons survive their first year. Those that do make it must live yet another year before they are old enough to breed. Of every 10 falcons released, three or four survive to breeding age. Some adult peregrines return to their hack site to breed, while others find a new breeding site. The birds may use the same nest site for many years.

Before peregrines are hacked in West Virginia, the Mountain State may be fortunate and "inherit" falcons reintroduced into other eastern states. Historic and other potential sites will be checked periodically in the spring to determine whether peregrines have immigrated voluntarily.

You can take an active part in re-establishment of the peregrine falcon in West Virginia. Report any peregrines you see to the Wildlife Resources Division of the Department of Natural Resources. With your cooperation, a little luck, and a helping hand through hacking, the peregrine will once again soar the skies over West Virginia—no longer an endangered species.

Peregrine Falcon

Falco peregrinus



The Nature Conservancy

Ed Maguire—Director of WV Chapter of TNC

The Nature Conservancy (TNC) is a national, non-profit conservation organization devoted to the protection of ecologically significant areas and the diversity of life that they support.

The Conservancy works by:

- —**Identifying** lands which contain the best examples of all components of the natural world; finding out what is rare and where it exists.
- —**Protecting** habitat and natural systems, usually through acquisition by gift or purchase; developing and using new alternative methods of protection; assisting or advising government or other conservation organizations.
- —**Managing** 700 Conservancy-owned preserves using staff and volunteer land stewards; encouraging compatible use by researchers, students and the public.

The Conservancy is not part of any government agency nor does it receive government support. TNC's activities are made possible through contributions, foundation grants, and membership dues. The Conservancy has been responsible for protection of over two million acres in all 50 states, Latin America, and the Caribbean. National membership stands at 200,000.

TNC's West Virginia Chapter was formed in 1963 concurrently with acquisition of 260 acres in the heart of Cranesville Swamp located in Preston County. Since then, 30,000 acres in West Virginia have received protection through the Conservancy's efforts. Over 27,000 of these acres were acquired for state and federal agencies through the assistance of the Conservancy. Examples include the 600-acre Shannondale Springs Public Hunting and Fishing Area which is now owned by the Department of Natural Resources, the 900-acre McClung addition to the Monongahela National Forest along the Cranberry River and mineral rights under the Dolly Sods Wilderness Area sold to the Forest Service in 1975.

The Conservancy's 1200-member West Virginia Chapter currently owns or leases 8 nature preserves in West Virginia, all of which are open to the public. Numerous other areas known as places where rare plants and animals live and grow are actively being investigated for protection. This fall TNC will launch its $200,000 WV Natural Areas Campaign which will seek to protect 8 different sites around the State—the most ambitious and comprehensive conservation effort ever launched by a private group in West Virginia.

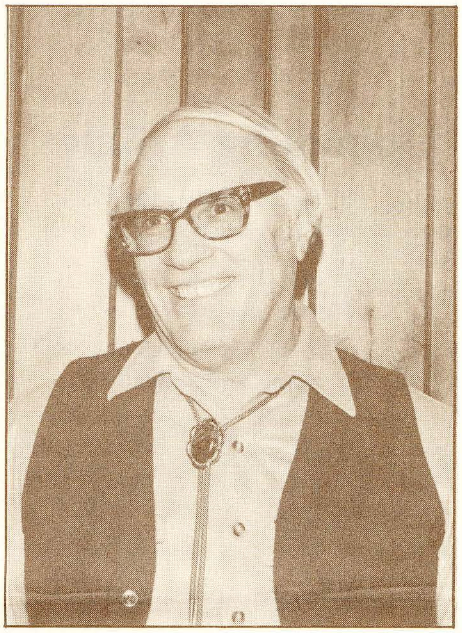
Membership in TNC entitles members to receive the national *Nature Conservancy News,* the quarterly WV Chapter Newsletter, and invitations to field trips and meetings throughout the year. Membership is open to all.

For additional information about the Conservancy, contact the West Virginia Field Office, 1100 Quarrier Street, Room 215, Charleston, West Virginia 25301. Phone (304) 345-4350.

THE NATURE CONSERVANCY

Backyard Habitat Kit

The National Wildlife Federation is offering a "Gardening With Wildlife" kit designed to help create a backyard environment where birds, butterflies, small animals, trees and flowers can thrive. Included in the kit's 33 items are a planting guide, wildlife habitat log to record species visitation, a bird feeding preferences booklet and patterns for building birdhouses and feeding stations. For more information or to purchase a kit for $14.95 (plus $1.55 shipping), write to National Wildlife Federation, Dept. 170, 1412 16th St., N.W., Washington, D.C. 20036.



Advisory Council Member Profile

Arnold Schulz, who has served on the Nongame Citizen's Advisory Council since 1982, is currently a Forest-Wildlife Biologist and Range Specialist for the U.S. Forest Service in the Monongahela National Forest. A native West Virginian, Mr. Schulz attended WVU where he received his Bachelor of Science Degree in Forestry, and Colorado State University where he earned his Master of Science degree in Game Management. Formerly an employee of the WV DNR in the deer management and research section, Arnold has served in his present capacity since 1957. Nongame and endangered wildlife species are of routine consideration in association with his work for the National Forest. In addition, Mr. Schulz is a wildlife artist and has, for the past 21 years, been a foray leader at the annual WV Wildflower Pilgrimage.

- For natural control of harmful insects, collect praying mantis egg cases from fields and put them in your garden or among shrubbery for the spring hatchings.

Upcoming Articles

Why Do Birds Migrate?

Eastern Cougar

West Virginia Osprey Reintroduction Project

Lead Poisoning and Nongame Wildlife

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A narrated slide show, developed to educate citizens about and promote the WV Nongame Wildlife Program, is available to all interested organizations for viewing. Contact the WV Nongame Program.

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Ideas for articles are welcomed

Remember to DO SOMETHING WILD! and support the West Virginia Nongame Wildlife Program.

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